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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/926,742	12/11/2001	Kiyohiko Yokota	216859USOXPC	1739
22850	7590	07/18/2005	EXAMINER	
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			TESKIN, FRED M	
			ART UNIT	PAPER NUMBER
			1713	

DATE MAILED: 07/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/926,742

Applicant(s)

YOKOTA ET AL.

Examiner

Fred M. Teskin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 11-18 and 20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 11-18 is/are rejected.
- 7) ☒ Claim(s) 20 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 032505.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

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A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicants' submission filed on August 13, 2004, has been entered. Accordingly, claims 11-18 and 20 are currently pending and under examination.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 11-18 stand rejected under 35 U.S.C. 103(a) as being unpatentable over EP 0 721 954 A1 ("European").

The rejection is maintained substantially for the reasons of record (see paper no. 5, pp. 5-6) and those which follow.

Applicants' arguments and the documentary evidence filed August 13, 2004, have been fully considered but are not persuasive of error in the repeated rejection.

Relying on two journal articles (Zambelli et al and Ishihara), applicants reassert the argument that differences in the electronic structure would lead to a corresponding

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difference of copolymerizability of the aromatic vinyl compounds as compared to alpha-olefins.

In particular, applicants first point to Table I of Zambelli et al as reporting catalyst activity data indicating that polymerizability of ethylene and styrene is quite different even when the same catalyst is used.

The relevance of these data to European is unclear, however, since they are based on an *unbridged, mono-cyclopentadienyl* titanium catalyst component (CpTiCl_3) distinct from the alkylene/silylene *bis-bridged* zirconocene catalyst specifically taught by European. And to the extent Zambelli et al is so relevant, examiner notes section 5), directed to polymerization of other monomers and copolymerization, where the authors state that "the same catalytic systems which promote syndiospecific polymerization of styrene are also active in the polymerization of ethylene and [alpha]-olefins ... substituted styrenes ... and conjugated diolefins These monomers can be also copolymerized to each other"

Thus, far from teaching away from the copolymerizability of ethylene or alpha-olefins and aromatic vinyl compounds, Zambelli et al explicitly suggest that the same catalytic systems active in promoting syndiospecific polymerization of styrene are active in copolymerizing certain aromatic vinyl compounds (substituted styrenes) with ethylene and alpha-olefins.

Applicants next point to Table 2 at page 561 of Ishihara as indicating that two different stereoregular polymers have been obtained by using the same catalyst.

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As most, the data in Table 2 show the capacity of certain metallocene-type catalysts to produce polypropylene and polystyrene *homopolymers* of different stereoregularity. The author attributes the different stereoregularities to different types of insertion occurring in the same catalyst (Ishihara, page 562).

It is not seen and applicants have not explained why the possible occurrence of different types of insertion in the same catalyst would have led one to doubt that styrene could be copolymerized with an alpha-olefin or ethylene using the polymerization catalyst of European. In the case of styrene and chiral alpha-olefin(s), one might expect a difference in stereoregularity of the corresponding polymerized units, but not a complete inability to form copolymer chains -- especially in view of the aforementioned discussion in Zambelli et al of the activity of catalytic systems active in promoting syndiospecific polymerization of styrene in copolymerizing monomers including ethylene, alpha-olefins and substituted styrenes to each other.

Accordingly, the documentary evidence submitted by applicants is not deemed probative of unobviousness.

Applicants further argue that European does not actually teach or describe that the aromatic vinyl compounds listed therein act as comonomer equally to the exemplified alpha-olefins such as 1-octene.

An express teaching of such equivalence is not, however, a prerequisite of the *prima facie* case, and examiner maintains that European would have at least implicitly suggested the general equivalence as comonomer of aromatic vinyl compounds like styrene to the alpha-olefins exemplified therein.

Thus, as pointed out in the previous Office action, European at page 19 teaches “the copolymerization of an olefin and another olefin and/or another monomer (i.e., the copolymerization of two different kinds of olefins, the copolymerization of an olefin with another monomer, or the copolymer of different kinds of olefins and another monomer) can be suitably carried out by the use of the above-mentioned catalyst ...”. Immediately following this passage is a paragraph wherein alpha-olefins having 2 to 20 carbon atoms are said to be preferable and examples of preferred alpha-olefins are given. The examples include styrene, p-methylstyrene, isopropylstyrene and t-butylstyrene, along with fourteen species of acyclic alpha-olefins including ethylene, propylene and higher 1-olefins like 1-octene. The paragraph concludes by stating, “the above-mentioned other olefin can also suitably be selected from these olefins mentioned above.”

That the olefins “mentioned above” may be suitably copolymerized is explicitly proposed in the next paragraph on page 19: “[I]n the present invention, the above-mentioned olefins may be used singly or in combination of two or more thereof. In the case that two or more olefins are copolymerized, these olefins can optionally be combined.”

Thus, contrary to applicants’ assertion, examiner remains of the view that European would have fairly suggested to those of ordinary skill that the specific aromatic vinyl compounds named therein would have been expected to perform equivalently to alpha-olefins such as 1-octene in the disclosed copolymerization of an olefin and another olefin.

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Accordingly, it is maintained that one of ordinary skill in the art would have been well motivated to modify European with a reasonable expectation of success; i.e., to utilize in lieu of 1-octene in any of Examples 2, 3, 7, 8, 12-15, 17-20 and 27, an aromatic vinyl compound such as styrene as comonomer, with a reasonable expectation of obtaining a copolymer having the desirable properties associated with an olefin homo- or copolymer obtained by use of the European catalyst (e.g., uniform composition and narrow molecular weight distribution, per page 3, lines 3-4).

In addition, European teaches or suggests all the claim limitations, since the specific copolymerization examples cited above all utilize species of alkylene/silylene bis-bridged catalyst corresponding to Formula (I) of independent claim 11.

Based on the foregoing, the continued rejection of claims 11-18 is still deemed to be tenable and therefore is maintained.

Claim 20 is objected to as being dependent on a rejected base claim but would be allowable if rewritten in independent form to include all the limitations of the base claim and any intervening claim.

The following is a statement of reasons for the indication of allowable subject matter: Claim 20 limits Y^1 and Y^2 to the alkylene groups and the substituent groups based on the description at page 6, penultimate line to page 7, line 5 of the specification as filed. Comparison of specification Examples 1-3 and 6 and Examples 4-5 and 7 reveals that the alkylene/alkylene bis-bridged catalyst exhibits high copolymerization

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activity vis-à-vis the alkylene/silylene bis-bridged catalyst. The increase in copolymerization activity obtained is not predictable from the prior art of record, and applicants' explanation of the effect of the difference in substituent groups between the two catalysts suffices to show the difference to be non-critical. Claim 20 is therefore allowed in view of the evidence of unexpected results.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner F. M. Teskin whose telephone number is (571) 272-1116. The examiner can normally be reached on Monday through Thursday from 7:00 AM - 4:30 PM, and can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached on (571) 272-1114. The appropriate fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

FMTeskin/07-01-05


FRED TESKIN
PRIMARY EXAMINER
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